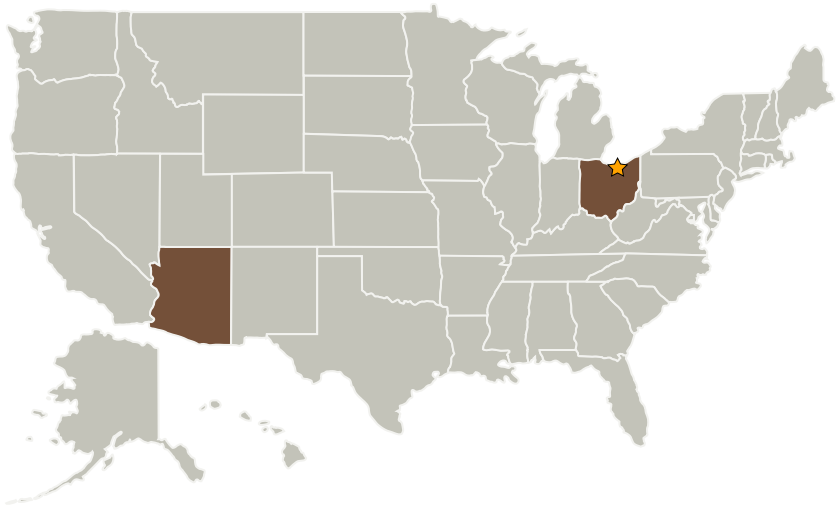
A Novel Heat Pipe Plate for Passive Thermal Control of Fuel Cells, Phase I

Completed Technology Project (2009 - 2009)

Project Introduction

This SBIR project aims to develop a lightweight, highly thermally and electrically conductive heat pipe plate for passive removal of the heat from the individual fuel cells or electrolysis cells within a cell stack. The desired heat pipe plate will be fabricated from a novel composite based on carbon nanotubes. Carbon nanotubes are possibly the best heat conducting material the world has ever known, as their unusually high thermal conductivity has been reported recently. In reality, however, such high thermal conductivity values have not yet been achieved in any carbon nanotube ensembles. This has been attributed to the thermal resistance presented at interface junctions between individual nanotubes. The Phase I effort will be focused on solving this problem by an innovative approach, which offers the potential of incorporating a high content of carbon nanotubes in the composite while interface thermal resistance being minimized. The Phase I work will build on our preliminary experimental results to establish the proof-of-concept.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
★Glenn Research Center(GRC)	Lead Organization	NASA Center	Cleveland, Ohio
Amsen Technologies, LLC	Supporting Organization	Industry	Tucson, Arizona

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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Glenn Research Center (GRC)

Responsible Program:

Small Business Innovation Research/Small Business Tech Transfer

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Arizona	Ohio

Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX14 Thermal Management Systems
  - TX14.2 Thermal Control Components and Systems
    - TX14.2.3 Heat Rejection and Storage